

as prime technical contact for the JEN coordinated the trip, and with various Hazards Control Department personnel, principally Arthur L. Anderson who is responsible for the LLL chest counting facility. The traveler participated in several days of scheduled counting and in a complete calibration of the counting system. Some of the recent data obtained in Spain was reviewed and interpreted. Possible methods of improving the counting system were discussed in detail.

## II. Los Alamos Scientific Laboratory (LASL)

John Umbarger, responsible for the LASL personnel counting facility, described their current calibration method and the traveler helped to perform a complete calibration. Several LASL employees were measured with the ultrasonic probe for chest thickness and counted for plutonium. Discussions of bioassay techniques were held with Industrial Hygiene Group personnel, principally with William Moss.

## III. New York University (NYU)

This facility was visited because of its extensive experience in using the phoswich detectors and its experience and expertise in detecting radioactivity in uranium miners and mill workers (usually lead-210). Norman Cohen described the proper procedures to be used in these measurements, and methods of calibration. Valuable discussions were also held with other personnel at this facility, notably Merrill Eisenbud.

The many discussions held at the three facilities were very beneficial and indicated aspects of the JEN counting facility that could be improved, particularly in the area of counter background. The visits were entirely successful and provided the traveler with a much better concept of the preferred procedures to be used in chest counting, the magnitude of errors inherent in such measurements, and the limitations in current techniques.

### ITINERARY

8 Nov 76	Travel Madrid to Livermore, CA.
9-12 Nov	Visit at Lawrence Livermore Laboratory Phillip N. Dean - Biomedical Sciences Division Arthur L. Anderson - Hazards Control Department
15 Nov	Travel to Los Alamos, New Mexico
16-19 Nov	Visit at Los Alamos Scientific Laboratory John Umbarger - Health Physics Group, Health Division William Moss - Industrial Hygiene Group, Health Division
21 Nov	Travel to New York
22-24 Nov	Visit at New York University Institute of Environmental Medicine at Sterling Forest Norman Cohen, Whole-Body Counting Facility Merrill Eisenbud, Director
28 Nov.	Travel New York to Madrid

## FOREIGN TRIP REPORT

Francisco de los Santos Sallinas  
Contador de Radiactividad Corporal  
Junta de Energia Nuclear  
Ministerio de Industria  
España

20 December 1976

### SUMMARY

This report covers a trip to the United States by Dr. Francisco de los Santos, chief of the total body counting facility of the Spanish Atomic Energy Commission. During the period 8 to 28 November 1976 the traveler visited three United States installations:

- 1) Lawrence Livermore Laboratory (ERDA) - Phillip N. Dean and Arthur L. Anderson.
- 2) Los Alamos Scientific Laboratory (ERDA) - John Umbarger.
- 3) New York University - Norman Cohen.

This trip was made to provide the traveler with practical experience and training in total-body and chest counting, as a part of project Indalo, a joint U.S. - Spain research program.

### TRIP REPORT

This trip was made as part of Project Indalo, a U.S. - Spain collaborative program, established by the Hall-Otero agreement of 1966, to study the physiological and ecological behavior of plutonium oxide in a contaminated rural agricultural environment. As a part of this program the Junta de Energia Nuclear (JEN) was provided with a total-body and chest counting facility, located in Madrid and calibrated there through the assistance of Phillip Dean of the Lawrence Livermore Laboratory. The traveler utilized this opportunity to visit three U.S. laboratories actively engaged in detecting plutonium in the human chest, to gain expanded knowledge of routine counting techniques.

#### I. Lawrence Livermore Laboratory (LLL)

Extensive discussions were held over a four day period with Phillip Dean, who

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JUNTA DE ENERGIA NUCLEAR  
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INFO: C. R. RICHMOND, ASSOCIATE DIRECTOR BIOMEDICAL AND  
ENVIRONMENTAL SCIENCES, ORNL, OAK RIDGE, TN

INFO: PHILIP DEAN, LAWRENCE LIVERMORE LABORATORY, LIVERMORE, CA

ZEN/USERDA, H. D. BRUNER, BER, GERMANTOWN, MD.

ZEN/USERDA, MARTIN MINTHORN, BER, GERMANTOWN, MD.

UNCLASSIFIED/N O N W D

WE HAVE BEEN PLEASED TO LEARN OF THE CORRESPONDENCE FROM DR.

EMILIO IRANZO TO ERDA STAFF, DR. H.D. BRUNER AND DR. MARTIN L.

MINTHORN, JR., CONCERNING PROJECT INDALO. UNFORTUNATELY

THERE WAS SOME DELAY IN RECEIVING HIS LETTERS, THUS, OUR EFFORT

TO EXPEDITE THIS COMMUNICATION.

WE APPRECIATE THE INTENSIFIED ACTIVITIES AND INCREASED RESOURCES

WHICH HAVE BEEN COMMITTED TO THIS SIGNIFICANT PROGRAM. ERDA IS

BE BRIEF—ELIMINATE UNNECESSARY WORDS

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MR. FRANCISCO PASCUAL

-2-

PLEASED TO CONTINUE ITS SUPPORT.

AS INDICATED IN MY LETTER TO YOU OF MARCH 16, 1976, WE KNEW THAT CERTAIN MINIMUM FUNDS SHOULD BE AVAILABLE IN FY 1977, AND THE ADVANCE BUDGET PLANNING, BASED ON INFORMATION THEN AVAILABLE, HAD BEEN IN RECOGNITION OF THE NEED TO SUSTAIN AN INCREASED LEVEL OF ACTIVITIES. THE ALLOCATION FOR PROJECT INDALO FINALLY APPROVED FOR FY 1977 IS \$50,000.00

WE ARE PREPARED TO MAKE THIS AMOUNT AVAILABLE THROUGH THE AMERICAN EMBASSY IN MADRID IN ACCORDANCE WITH ESTABLISHED PRACTICE. PLEASE LET US KNOW IF THIS IS ACCEPTABLE. END